

United States Department of Agriculture Forest Service Aviation Safety Alert

No. 2004-01

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Subject:

Risk Awareness and Management in System Safety

Area of Concern:

Fire Operations

Distribution:

USFS Aviation Operations

Discussion: This Safety Alert consolidates and supercedes issues previously issued under Safety Alerts 2003-01, 09, and 10 to maintain awareness of hazards associated with environmental changes, communicating aerial observations, and reporting hazards as means of managing risks.

1) During the 03 fire season, 4 significant incidents were identified relating to changing environmental conditions or encountering unexpected weather. In all cases, missions were aborted and, in one event, minor injuries were sustained. Communications from flight service stations or surface units at the scene may have provided the crews with additional information that could have been useful in their risk assessment.

2) Another incident identified witnesses hearing a sharp rumble or series of loud “reports” like a shotgun coming from a turbine powered helicopter, the engine may have experienced a compressor stall (air flow reversal). This can cause the engine not to produce power and may lockup a power/drive train component (i.e. transmission, drive shaft, and gearbox) for a fraction of a second. The hazard was not immediately reported.

3) Many incidents indicate that risk management failures have occurred when the environment or the operation presents changing hazards. These are key **Safety Items** of which aerial and ground firefighters must have common knowledge and timely notification:

- **Fire Behavior** – Creeping, Backing, Running, Torching, Crowning, Spotting?
- **Weather Changes** - Thunder Cells? Wind? Other un-forecasted events?
- **Vegetation Changes** – Heavy, medium, light? Continuous? Broken? Natural Barriers?
- **Fuel Changes** – Burning in & moving toward: Trees? Grass? Brush?
- **Aspect Changes** – N,S,E,W facing. Slope reversals?
- **Topography Changes** – Ridgetops, Canyons, Saddles,
- **Assets at Risk** – Improvements, Structures, Vehicles, Public
- **Advantageous Strategic Locations** – Natural Barriers, Fuel Breaks, Roads
- **Fire Size** – your best estimate – 1 football field = approx. 1 acre

- 4) Aerial Firefighters are often asked to be “eyes in the sky” without more specific direction. Flight crews can use LCES as a memory jogger when you observe an opportunity to assist the ground with a hazardous situation:

Lookout
Communications
Escape Routes
Safety Zones

Recommendation:

The easiest and most effective measure for mitigating hazardous scenarios is to reduce exposure to the risk. In fire aviation this can be done in three primary ways.

1. Identify the risk
2. Increase the distance from the risk.
3. Decrease time of exposure to the risk.

These three measures, when effectively communicated and/or managed, increase the likelihood that errors in judgment will not result in serious consequences (i.e. injuries or accidents).

/s/ Ron Hanks - USFS National Aviation Safety and Training Manager

/s/ Pat Norbury – USFS National Aviation Operations Officer